

Specification for

100° Countersunk precision head aluminium and aluminium alloy rivets*

ICS 49.030.60

***Index form of title:** Rivets, 100° countersunk precision head, in L36, L37, L58 and L86 materials.

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Foreword

Publishing information

BS 2SP 68 to BS 2SP 71:1973+A3:2015 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 January 2015. It was prepared by Technical Committee ACE/12, *Aerospace Fasteners and Fastening*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

BS 2SP 68 to BS 2SP 71:1973+A3:2015 supersedes BS 2SP 68 to BS 2SP 71:1973 (incorporating Amendments No.1 and No.2) which is withdrawn.

Information about this document

The first issue of these British Standards marked a departure from the traditional method of dimensioning countersunk head rivets by means of toleranced dimensions for the head diameter, head thickness, land and angle. The method now adopted is known as the “flushness tolerance” method and was first used for countersunk fasteners in BS 1981, *Unified machine screws and machine screw nuts*. Its basic principles and advantages are outlined in Appendix A to this standard, which also gives details of suggested methods of gauging. The standards include the marking of rivets as agreed by ISO/TC 20 — Aircraft and space vehicles, and a method for the identification of undyed versions of the rivets.

Details of rivets with radiused tails for use in auto-riveting machines are given in Appendix B.

Text introduced or altered by Amendment No. 3 is indicated in the text by tags **A3** **A3**. Minor editorial changes are not tagged. Previous amendments are not indicated.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date	Comments
2388	November 1977	
3263	June 1980	
A3	January 2015	See Foreword

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1 Scope

These British Standards specify the materials, dimensions, finish, marking and part numbers of 100° countersunk precision head aluminium and aluminium alloy rivets for aerospace use.

NOTE The figures in inch units are to be regarded as the standard. ^{A3} Accurate metric conversions should be based on the tables in BS 350. ^{A3}

2 Material and manufacture

The rivets shall be manufactured from the appropriate material specified in Table 1 in the condition as supplied.

3 Condition of rivets

3.1 Rivets to BS SP 68 require no heat treatment.

3.2 Rivets to BS SP 69 require heat treatment in accordance with 10.1 and 10.2 before use.

3.3 Rivets to BS SP 70 require no heat treatment.

3.4 Rivets to BS SP 71 shall be finally heat treated by the rivet manufacturer in accordance with 10.3.

4 Dimensions

The rivets shall conform to the dimensions specified in Table 2 and Table 3.

5 ^{A3} Protective finish ^{A3}

5.1 The rivets shall conform to the finish for the appropriate material specified in Table 1.

5.2 Anodic treatment shall be in accordance with the requirements of the latest issue of ^{A3} MoD Defence Equipment and Support Standard Def Stan 03-25 ^{A3}.

5.3 Chemical oxidation shall be in accordance with the requirements of the latest issue of ^{A3} MoD Defence Equipment and Support Standard ^{A3} DTD 913.

5.4 Colouring shall be in accordance with the requirements of the latest issue of ^{A3} MoD Defence Equipment and Support Standard ^{A3} DTD 913, or other approved process e.g. ^{A3} Def Stan 03-25 ^{A3}.

6 Gauging

The method of head dimensioning shown in Table 2 defines maximum and minimum head envelopes which control flushness in relation to a countersink of nominal dimensions.

The type of gauge in Figure 5 and Figure 6 is recommended as being suitable for flushness measurement, but the type of gauge to be used is not a mandatory requirement of this standard. The gauge shown in Figure 5 and Figure 6 does not control the head angle which will require to be checked at intervals during production. An additional gauge will be necessary for the absolute minimum head diameter.

7 Identification and marking

7.1 The marking of the rivets shall be as specified in Table 1, and shall be applied as follows.

- 1) Rivets over $\frac{3}{32}$ in diameter which do not exceed 8 diameters in length shall be marked on the shank end with the exception of the $\frac{1}{8}$ in diameter which may be marked on the head.
- 2) Rivets $\frac{1}{16}$ in and $\frac{3}{32}$ in diameter in all lengths, and rivets over $\frac{3}{32}$ in diameter which exceed 8 diameters in length, may be marked on either the head or the shank end.

The marking, whether indented or embossed, shall be clearly visible and the height or depth shall not exceed the following dimensions.

- 0.006 in on sizes up to and including $\frac{1}{8}$ in diameter;
- 0.008 in on sizes $\frac{5}{32}$ in and $\frac{3}{16}$ in diameter;
- 0.010 in on sizes $\frac{7}{32}$ in diameter and over.

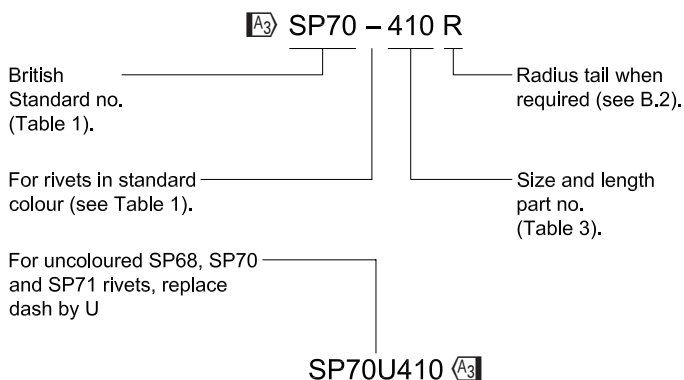
7.2 Rivets identified by old-style markings may be supplied until existing stocks are consumed. The obsolescent markings are as follows.

Material	Marking
L 36	1
L 37	7
L 58	8
L 86	0

7.3 The rivets shall be identified for ordering purposes by the relevant British Standard number (see Table 1) and the appropriate part number (see Table 3), e.g. a rivet in L 58 material $\frac{3}{8}$ in diameter $\times \frac{5}{8}$ in length is $\boxed{A_3}$ SP70-410. $\boxed{A_3}$

7.4 Undyed versions of rivets shall be identified by their part number with the letter U in place of the dash.

7.5 Example of call-up:



8 Inspection

It is recommended that inspection be by quality control methods designed to ensure that the manufacturing process is stable and that the rivets meet the requirements of the specification.

9 Freedom from defects

The rivets shall be free from harmful defects.

The rivets may be rejected at any time for faults in, or revealed by, manufacture, although they have been made from material passed previously for chemical composition and mechanical properties.

10 Heat treatment of rivets

10.1 Immediately before use or before refrigeration as described in **10.2**, rivets to BS SP 69 shall be heated uniformly at a temperature of 495 ± 5 °C and quenched in water at a temperature not exceeding 40 °C.

10.2 Rivets to BS SP 69 commence to age harden immediately when kept at atmospheric temperature after quenching. Ageing may be delayed, however, by storing the rivets at low temperatures after quenching, and they may be expected to remain in a condition suitable for closing for a period depending on the storage temperature as shown below:

Temperature	Maximum storage period
0 °C to – 5 °C	45 hours
– 15 °C to – 20 °C	150 hours

The rivets shall be closed within two hours of solution treatment if kept at atmospheric temperature or within two hours of removal from cold storage.

10.3 Rivets to BS SP 71 shall be heat treated by the rivet manufacturer as follows.

Solution treat at a temperature of 495 ± 5 °C and quench in water at a temperature not exceeding 40 °C. Age at room temperature for not less than four days.